

WHAT IS CLAIMED IS:

1. An optical disk apparatus recording and/or reproducing a signal synchronously with a fine clock mark formed in advance on an optical disk, comprising:

5 a sensor having first and second regions arranged along a track of said optical disk and detecting light reflected from said optical disk in each region;

a subtracter subtracting an output signal from said second region from an output signal from said first region to detect said fine clock mark and generate a fine clock mark signal;

10 an adder adding the output signal from said first region to the output signal from said second region to generate a sum signal; and

a defect remover setting level of said fine clock mark signal to zero when level of said sum signal is lower than a predetermined level.

2. The optical disk apparatus according to claim 1, wherein said defect remover includes:

a defect detector generating a defect detection signal when the level of said sum signal is lower than said predetermined level; and

5 a setter setting the level of said fine clock mark signal to zero in response to said defect detection signal.

3. The optical disk apparatus according to claim 2, wherein said defect detector includes:

an A/D converter digitizing said sum signal; and

5 a DSP receiving a digital sum signal output from said A/D converter to activate said defect detection signal when level of said digital sum signal is lower than said predetermined level and inactivate said defect detection signal when the level of said digital sum signal is higher than said predetermined level.

4. The optical disk apparatus according to claim 3, wherein

said DSP includes:

a comparator comparing the level of said digital sum signal with said predetermined level;

5 an activator activating said defect detection signal when the level of said digital sum signal is lower than said predetermined level according to result of comparison by said comparator; and

10 an inactivator inactivating said defect detection signal when the level of said digital sum signal is higher than said predetermined level according to result of comparison by said comparator.

5. The optical disk apparatus according to claim 2, wherein said defect detector includes a comparator comparing the level of said sum signal with said predetermined level to generate said defect detection signal.

6. An optical disk apparatus recording and/or reproducing a signal by directing a laser beam onto an optical disk comprising:

5 an objective lens focusing said laser beam on said optical disk;  
an optical sensor divided into a plurality of regions to detect light reflected from said optical disk in each region;

a focus error signal generator performing arithmetic operation on respective signals output from the regions of said optical sensor to generate a focus error signal;

10 a focus servo controller performing focus servo control for said objective lens in response to said focus error signal;

a sum signal generator calculating sum of respective outputs from the regions of said optical sensor to generate a sum signal; and

15 a defocus detector determining that focus of said objective lens deviates from said optical disk when value of said sum signal is lower than a predetermined threshold.

7. The optical disk apparatus according to claim 6, further comprising a servo control stopper stopping said focus servo control when

said defocus detector determines that the focus of said objective lens deviates from said optical disk.

8. The optical disk apparatus according to claim 6, further comprising a learner detecting a peak value and a bottom value of said focus error signal generated when said objective lens is moved in direction of its optical axis to set said predetermined threshold between the detected peak and bottom values.

9. The optical disk apparatus according to claim 6, wherein said defocus detector includes:

a value comparator comparing the value of said sum signal with said predetermined threshold;

a timer measuring a time period in which the value of said sum signal is lower than said predetermined threshold according to result of comparison by said value comparator; and

a period comparator comparing the period measured by said timer with a predetermined threshold period to determine that the focus of said objective lens deviates from said optical disk when said measured period exceeds said predetermined threshold period.